Harnessing the Wind

Outline of Need:

The Glen Coble & Sons ranch is a 1200 unit cow-calf operation located in the rural area of Mullen, Nebraska approximately 30 miles from the nearest town. The Coble's were exploring their options to utilize a renewable energy source to generate electrical power to a portion of the ranch. They leaned towards wind as it is always dependable in the area.

How Rural Development Helped:

During the summer of 2008, 5 Skystream model #3.7, 1.8 kW wind turbines were installed at the hilltops of a large Sandhill range. The power generated is anticipated to be sufficient for 2 submersible ¾ hp livestock wells, a 15 hp electric turbine irrigation pump and external and engine block heaters for a portion of the company's machinery equipment during the winter months. USDA Rural Development provided a $14,725 grant from the 9006 Renewable Energy/Energy Efficiency Program to offset the expenses of this project.

The Results:

The 5 turbines collectively produce, with a 23 mph wind, 9 kw/hour. The Skystream 3.7™ is a new generation wind generator that's considered the first all-inclusive wind generator (with controls and inverter built in) designed to provide quiet, clean electricity in very low winds. The Skystream 3.7 operates by converting the kinetic energy of the wind into rotational motion that turns an alternator and ultimately produces usable electric power. Skystream will begin producing power in a wind of approximately 8 mph (3.5 m/sec). At that speed the blades rotate at approximately 120 rpm. Once it has started producing power, it will continue to produce power at lower speeds down to 80 rpm and less than 3 m/s. As the wind speed increases so does the blade speed. At about 20 mph (9 m/sec) the blades achieve a rotational speed of 330 rpm, Skystream's rated speed. Should wind speed increase above 20 mph the blade speed will remain essentially fixed at 330 rpm. If a condition occurs that causes the rotational speed to exceed 360 rpm, Skystream will shut down for approximately 10 minutes after which it will resume normal operation unless a fault is detected causing it to remain shut down. Once the turbines have proven successful to energy power generation and a cost savings, Glen Coble & Sons are considering constructing additional turbines for the ranch headquarters.

"Our electrical need from the utility has been reduced by 1/3. The power factor over the past 7 months has averaged 30 percent which is based on actual production and capacity. We also appreciate the quietness of these turbines and the fact that they have not disturbed the wildlife or welfare of the cattle. The deer and cattle graze right up to the base of these turbines."
—Matt Coble

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